

## **REMARKS**

Upon entry of the present Amendment, claims 1-17 remain pending in the application, of which claims 1, 11 and 15 are independent.

### **Amendments Presented**

Independent claims 1, 11, and 15, as well as dependent claims 3, 7, 8, and 17 have been amended herein to more particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the independent claims are amended to better define the elongate nature of the light guide and the fact that the light emitting face thereof extends in the longitudinal direction of the guide and emits light in a line shape; claim 3 is slightly amended to more clearly define that the claimed image reader comprises the light guide of claim 1, together with several other components; claims 7 and 11 are amended to define that the prescribed emission angle is with respect to the emitting face; and claims 8 and 17 are amended to further define that the line segment connecting the focal points corresponds to a bottom face of the light guide extending longitudinally thereof.

Applicant respectfully submits that the above amendments to the claims are fully supported by the original disclosure, including the specification, claims and drawings, especially Figures 1 -4 and the discussion contained thereof at paragraphs [001], [002], [007]-[010], and [018]-[030].

Applicant also respectfully submits that no new matter is introduced into the application by the above amendments because all of the subject matter thereof was expressly or inherently disclosed in the original application.

### **Response to Office Action**

The above-identified Office Action has been reviewed, the references carefully considered, and the Examiner's comments carefully weighed. In view thereof, the present Amendment is submitted.

It is contended that by the present Amendment, all bases of objections and rejections set forth in the Office Action have been traversed and overcome. Accordingly, reconsideration and withdrawal of the rejection is respectfully requested.

**Claim Rejections – 35 USC §112**

At page 2 of the Office Action, the Examiner has rejected claims 1-7 (? 1-17) under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Particularly, the Examiner states that it is not clear whether the applicant is claiming a light guide as cited in claims 1-2 and 7-10 or an image reader as in claims 3-6.

*Applicant's Response:*

Upon careful consideration and in light of the above amendment to claim 3, applicant respectfully traverses such rejection since the invention as claimed would be clearly understood by persons skilled in the art when considered in light of the present specification (which is the test applied by the courts), e.g., claims 1, 2, and 7-17 are directed to a light guide having certain characteristics, while claims 3-6 are directed to an image reader including (as one component thereof) the light guide as defined in claim 1. There is nothing confusing about the claim language.

Additionally, the above amendment to claim 3 is believed to further clarify the nature of the image reader, and hence avoid any indefiniteness under 35 USC 112, second paragraph.

For all the foregoing reasons, applicant respectfully requests reconsideration and withdrawal of the Examiner's rejection under 35 USC §112, second paragraph.

**Claim Rejections --35 USC §102**

At pages 2-4 of the Office Action, the Examiner has rejected claims 1-2 and 7-17 under 35 USC §102(b) as being anticipated by the optical coupling apparatus disclosed by Guy (US

6,937,791). Regarding claims 1, 11 and 15, the Examiner asserts that: the optical coupling apparatus shown in Guy's Fig. 7 includes a light guide 104a (Solid conic body 104) having an end face having a light emitting diode 28 (Domed portion of the extended light source 12, which may include an LED disposed on a circuit board) providing an incident face, an emission face 18 (optical light guide element such as an optical fiber), an internal face, and the guide have two parabolas connected by a line segment connecting the parabolas at a focal point and a line segment corresponding to the emitting face. It is also the Examiner's position that Guy's optical coupling apparatus includes all of the features defined in dependent claims 2, 7-10, 12-14, 16-17.

*Applicant's Response:*

Upon careful consideration and in light of the above amendments clarifying the elongate nature of the light guide and of the emission face which emits light in a line shape, applicant respectfully traverses such rejection, and submits that claims 1, 2 and 7-17 are patentably distinct over the teachings of Guy, because Guy 's optical coupling apparatus does not include several required features of independent claims 1, 11 and 15, as well as features of the dependent claims. Further, Guy's optical coupling apparatus otherwise functions fundamentally differently than the claimed invention in both structure and function, and fails to address or overcome the problem address by the claimed invention.

Regarding the fundamentally distinct nature of the claimed invention in comparison to Guy's coupling apparatus, the object of Guy's invention (i.e., provision of an extended light source (guide) which focuses / couples substantially all of the optical energy of a light source (LED) onto a point corresponding to an input end of an optical light guide / fiber) is directly contrary to that of the present invention (i.e., provision of an elongate, bar-shaped light guide wherein light emitted from the elongate emission face thereof is confined to a prescribed emission angle relative to the emission face, rather than a full angle).

As an example of a specific deficiencies of Guy's coupling apparatus relative to the claimed invention, the emitting face of the light guide according to the independent claims is defined as "*extending longitudinally* of the light guide", which relates to the elongate nature of the light guide and the fact that emitting face outputs light in a *line shape*. Conversely, in Guy's coupling apparatus light is initially emitted through the domed portion/lens 28 of the light source 12 in a semi-spherical pattern, after which the emitted light is then focused by the spherical focusing lens 26 and the solid *conical* body 14 such that all of the light is then focused at a second focus *point* F2, which corresponds to an input end of the optical light guide (fiber) 18 which guides the light elsewhere. Thus, both the first portion and the second portion of the optical signal from the extended light source are focused on the light guide element. With Guy's structure there is no (elongate) emitting face *extending longitudinally* of the light guide. The only emitting face is the domed – hemispherical portion 28, and this does not extend in the longitudinal direction of the conical body 14. Again, this distinction is further emphasized by the above amendments.

In this regard, while the present disclosure does not provide a perspective view of the elongate light guide, but instead describes same, e.g., at paragraphs [018] – [030], the Examiner may (for example) refer to US Patent 7,316,353 for a perspective view of such an elongate light guide

As another example, a *sectional shape* of Guy's conical body 14 in a direction orthogonal to the longitudinal direction of the body 14 is *necessarily circular*. Hence it does not include two opposite parabolas, a line segment connecting the focal points of the parabolas, and a line segment corresponding to the emitting face and which is disposed opposite to the other line segment, as required by the independent claims. Applicant has considered the Examiner's comments regarding the sectional shape of Guy's conical body, but respectfully traverses the

same because they are not supported by Guy's actual disclosure. Perhaps the Examiner has misinterpreted the shape and explanation of the conical body 14 shown in Guy's Figs. 3 and 6-9. However, the three-dimensional shape of the body is "conical" as described and plainly shown in Guy's Fig. 3, whereas the sectional views of the conical guide shown in Guy's Figs. 3 and 6-9 are not in a direction orthogonal to the longitudinal axis of the guide, but are parallel to same.

Further, as regards dependent claims 2, 7-10, 12-14 and 16-17, applicant notes, for example, that : Guy discloses that the light rays entering the reflector cavity from *the larger, diverging end* and undergo a single reflection prior to being focused to a point at an entrance face of the light guide member 18, whereas the present claims define that the *bottom face has a smaller surface area than the emitting face of the light guide*; the present claims define a light scattering pattern is provided on the smaller bottom face of the light guide, whereas Guy does not include any such feature; etc.

Based on the foregoing, applicant respectfully submits that that the Examiner has failed to establish prima facie anticipation of claims 1, 2, and 7-17 under 35 USC §102. Accordingly, applicant respectfully requests that the rejection be reconsidered and withdrawn in relation to the present claims.

Claim Rejections – 35 USC §103(a)

At pages 3 and 4 of the Office Action the Examiner rejected claims 3-6 under 35 USC §103(a) as being unpatentable over Guy as applied to claims 1 and 2 and further in view of the line illuminating device of Saito et al. (US 7,284,891). It is the Examiner's position that it would have been obvious to one of ordinary skill in the art at the time of the invention to have combined the optical coupling apparatus of Guy with the illumination device of Saito in order to provide a means of concentrating a large amount of light toward an image while maintaining a cool light source.

*Applicant's Response:*

Upon careful consideration, applicant respectfully traverses such rejection, and submits that claims 3-6 are patentably distinct over the teachings of Guy and Saito based on the discussed deficiencies of Guy relative to claims 1-2, which are not overcome by Saito, and because the proposed modification of Guy's coupling apparatus with the image-scanning device of Saito is improper because the two devices are structurally and functionally incompatible and provide no motivation for the proposed combination.

While Saito discloses a line-illuminating device and image-scanning device incorporating same which generally correspond to the present invention, Saito does not disclose or suggest that his bar-shaped light guide has a compound parabolic concentrator (sectional) shape as set forth in the present claims, and thus fails to overcome the deficiencies of Guy.

On the other hand, given that Guy's coupling apparatus specifically seeks to concentrate light emitted from a light source to *a point*, e.g., such that it can be focused on the end of an optical fiber, it would never be obvious to combine this apparatus into Saito's image-scanning device which requires light to be output in a line shape (not as a point). The two systems are incompatible, and persons skilled in the art would correspondingly never consider the proposed combination to be obvious or desirable.

Based on the foregoing, applicant respectfully submits that the Examiner has failed to establish *prima facie* obviousness of claims 3-6 under 35 USC §103. Correspondingly, applicant respectfully requests that the rejection be reconsidered and withdrawn.

**Conclusion**

Based on all of the foregoing, applicant respectfully submits that all of the objections and rejections set forth in the Office Action are overcome, and that as presently amended, all of the pending claims are believed to be allowable over all of the references of record, whether considered singly or in combination.

Applicant requests reconsideration and withdrawal of the rejections of record, and allowance of the pending claims. The application is believed to be in condition for allowance and a notice to this effect is earnestly solicited.

If the Examiner is not fully convinced of the patentability of all of the claims now in the application, applicant respectfully requests that the Examiner telephonically contact applicant's undersigned representative to expeditiously resolve any issues remaining in the prosecution of the application.

Favorable reconsideration is respectfully requested.

Respectfully submitted,



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